UNITED STATES ARMY
MARKSMANSHIP UNIT

M-14 RIFLE ACCURIZATION

(ALSO APPLICABLE TO M1A RIFLES)

GUIDE TO NATIONAL MATCH ACCURIZING AS PERFORMED BY U.S. ARMY SHOOTING TEAM GUNSMITHS



ACCURIZED NATIONAL MATCH
M-14 RIFLE "M-14 (MTU-NM)"

FOREWORD

Because of the many requests for technical information on accurizing the M-14 Rifle from individual rifle accuracy specialists and organizations within and outside the military services, the United States Army Marksmanship Unit offers this brief coverage of the procedures we believe necessary to achieve greater accuracy with this weapon.

Constructive comments are invited. Please address your correspondence to: Commander, United States Army Marksmanship Unit, Fort Benning, Georgia 31905.

STANLEY J. PARMENTIER
Colonel, Infantry
Commanding

THE UNITED STATES ARMY MARKSMANSHIP TRAINING UNIT

STANDARDS AND PROCEDURES

FOR

REBUILD OF RIFLE 7.62 MM M-14 NATIONAL MATCH

TO MEET

USA - MTU SPECIFICATIONS

1. <u>COVERAGE</u>

1.1 The requirements for accuracy and stability of a rifle used at this level are much more refined than that used by the average soldier. The following rebuild specifications, testing procedures and grouping characteristics must be demanded for each individual rifle.

2. <u>REQUIREMENTS</u>

2.1 The procedures or characteristics specified here are in addition to those of Army Weapons Command for the National Match Rifle and supercede them when requirements are more specific or exacting.

3. <u>TESTING</u>

3.1 The rifle will be held in a recoiling type test cradle and must be tested in a completely assembled condition.

3.2 Test ammunition shall be cal 7.62 mm NATO M-118 Match.

3.3 Average extreme spread for three consecutive ten shot groups shall not exceed six (6) inches at a range of 300 meters.

(The above criteria is based upon ammunition with an extreme spread capability of 3.5 inches at 300 M). If the ammunition shows an extreme spread larger than 3.5 inch, the weapon will be allowed 2.5 inch greater than the capability of the ammunition.

4. SPECIFICATIONS

4.1 Barrel. Must meet NM specifications with these additional requirements:

4.1.1 Bore diameter shall be 0.3004 plus or minus 0.0002, but shall not have over 0.0001 variation in any one specific barrel and in no case be larger at the muzzle end than at the breech.

4.1.2 Groove diameter shall be 0.3083 plus or minus 0.0002, but shall not have over 0.0001 variation in any one specific barrel and in no case be larger at the muzzle ened than at the breech.

4.1.3 Shall be knurled on the exterior in that area designated to position the operating rod guide. Knurling to be straight in configuration and to increase the diameter at this point to 0.808 plus or minus 0.0002. Knurling will be done in such a manner as to alleviate any possibility of an internal constriction in the barrel. The purpose of this knurl is to provide a tight, non-rotating fit for the operating rod guide when in its assembled position on the barrel. See illustration "A".

4.1.4 Headspacing will be held to the following dimensions:

"GO" gage.............................. 1.631"
"NO-GO" gage......................... 1.635"

4.2 GAS CYLINDER AND LOWER BAND ASSEMBLY

4.2.1 The gas cylinder and lower band will be permanently assembled to each other as shown in illustration "B".

4.2.2 The spindle valve must be annealed prior to drilling and tapping. The characteristics of this steel are such that it will require a temperature of 1200° initially and this temperature must be lowered slowly over a period of several hours before the metal is soft enough to drill. The lower band should be annealed prior to reaming and drilling. It should be reamed .020 (refer to Figure B.1) so that it will not contact the outside of barrel or lower part of cylinder.

4.2.3 The drilling operation is done as follows: The spindle valve, gas cylinder and lower band are assembled on fixture #1 as illustrated in "C", and an extended #31 drill is used, drilling through all three components, but stopping prior to breaking through the forward portion of the gas cylinder.

4.2.4 The holes in the spindle valve are then tapped with a 6-32 thread.

4.2.5 An 82° countersink is used on the rear face of the lower band, in each hole, to a depth where an Allen 6-32 "NYCOK" flat head cap screw will be flush with the surface.

4.2.6 The #31 drill holes in the gas cylinder must be enlarged to a clearance diameter, with the use of a #27 drill. An 82° countersink is used to provide clearance for the forward edge of the screw head due to the thinness of the material in the lower band.

4.2.7 Assembly: The components are assembled in their proper position, epoxy cement placed on the screws and all parts firmly pulled together. Upon the hardening and curing of the epoxy, the unit is to all effects a single piece.

4.2.8 Note that the spindle valve is now permanently locked in the open position.

4.2.9 The inside of the gas cylinder is now polished with "Wet or Dry" abrasive paper mounted on a mandrel; first with 320 grit, and then finally with 400 grit. This is to reduce carbon buildup while firing.

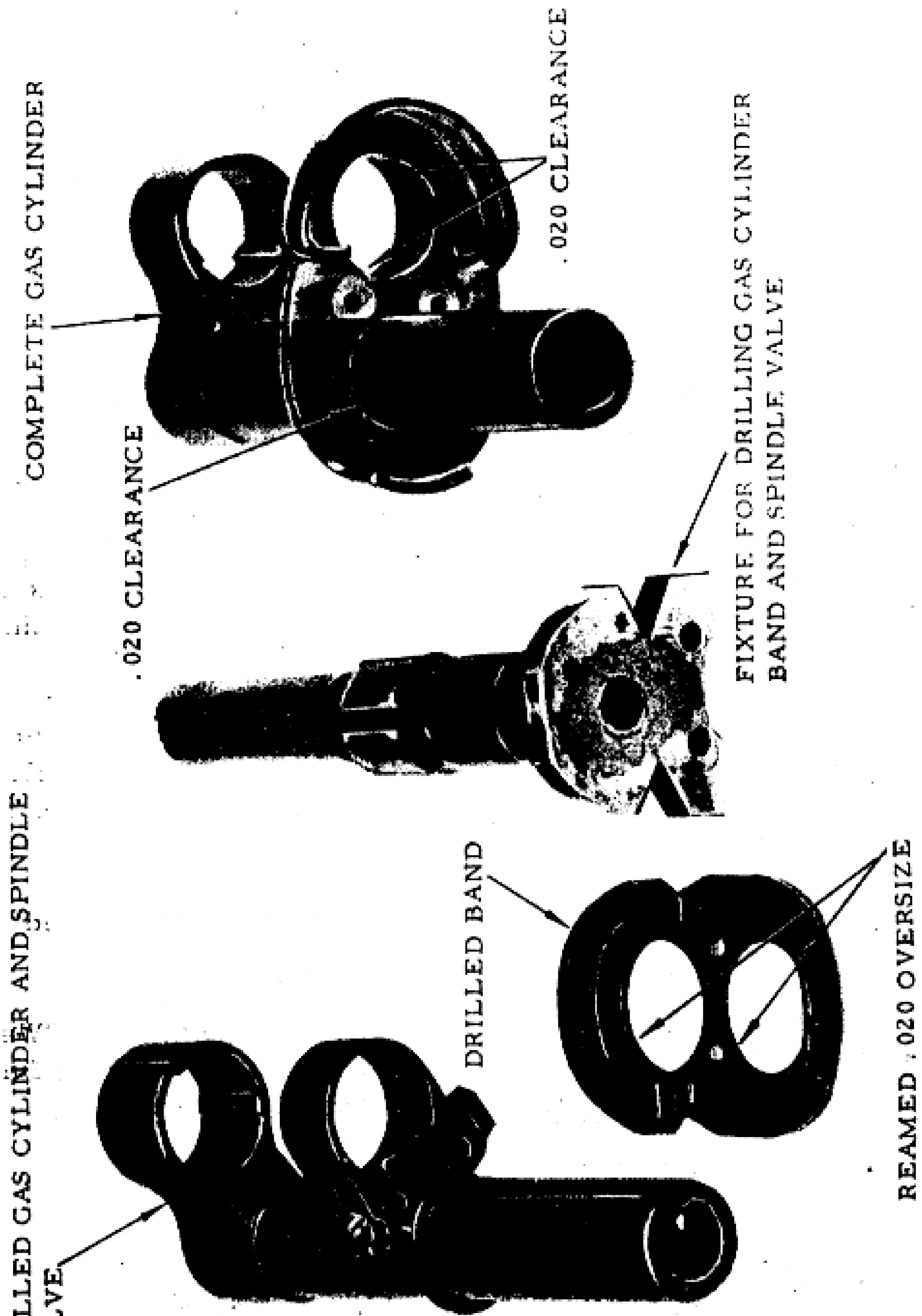
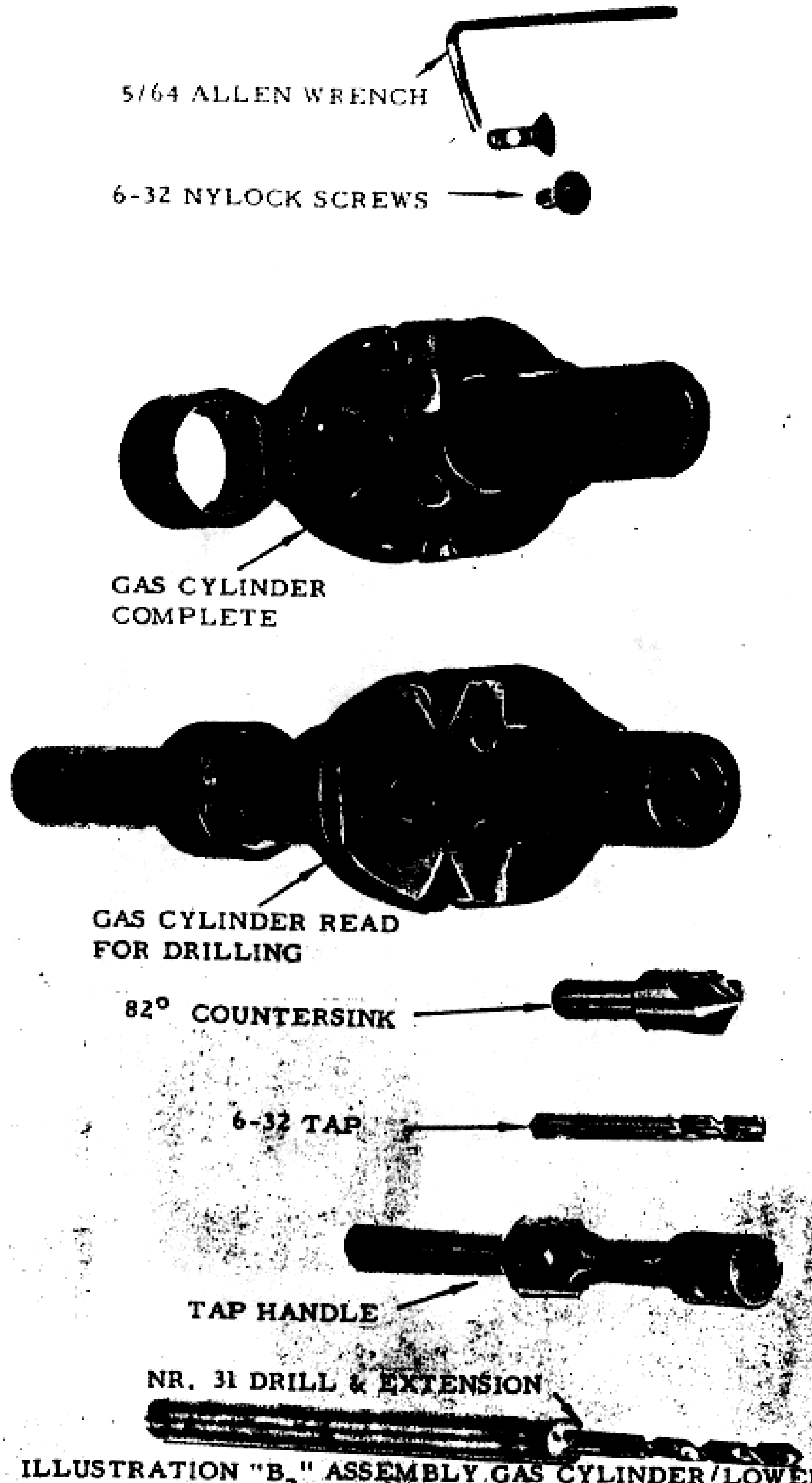


ILLUSTRATION "B_1" ASSEMBLY GAS CYLINDER/LOWER BAND



TOOLS FOR MODIFICATION OF GAS CYLINDER, BAND AND SPINDLE VALVE

 ILLUSTRATION "B_2" ASSEMBLY GAS CYLINDER/LOWER BAND

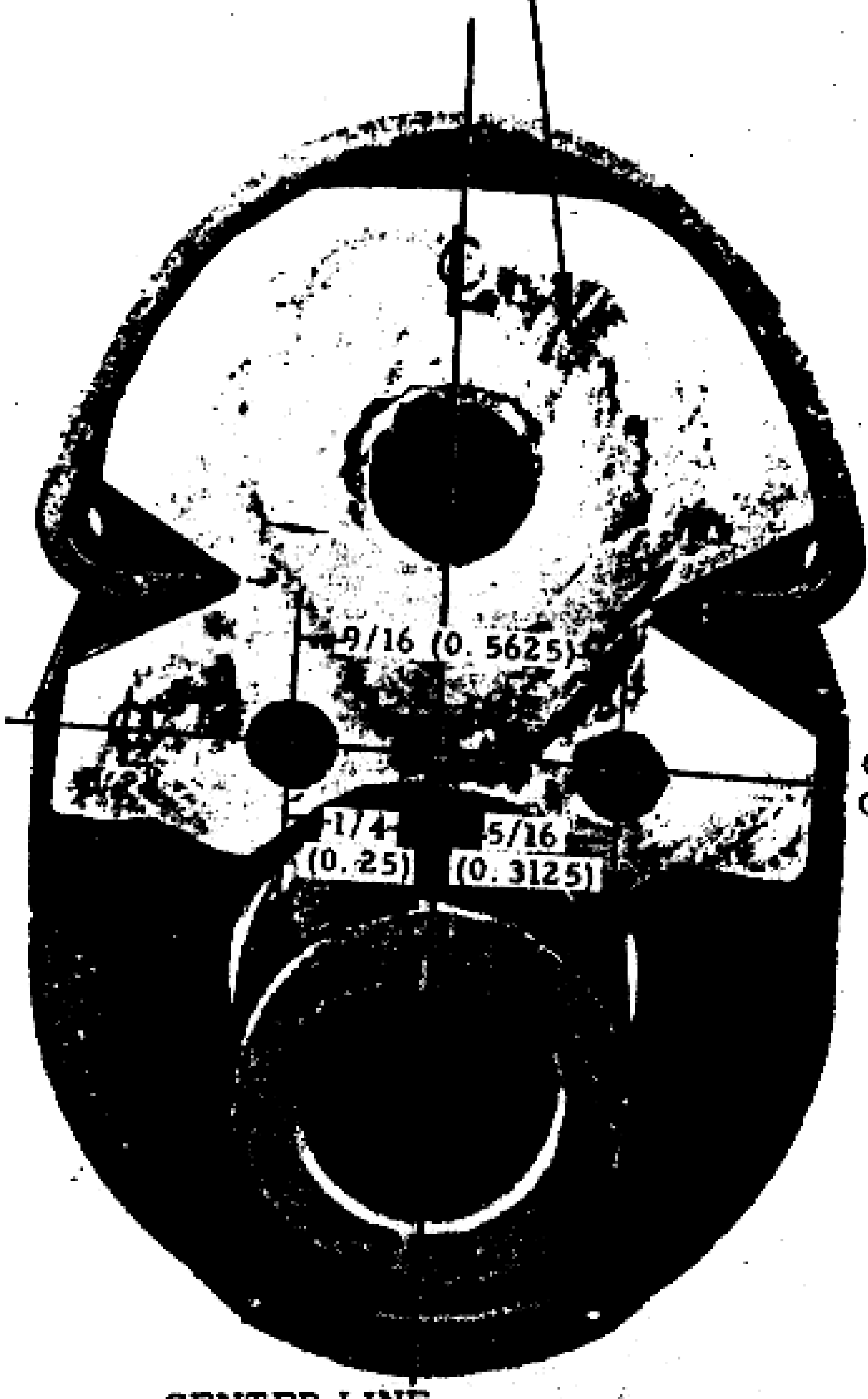
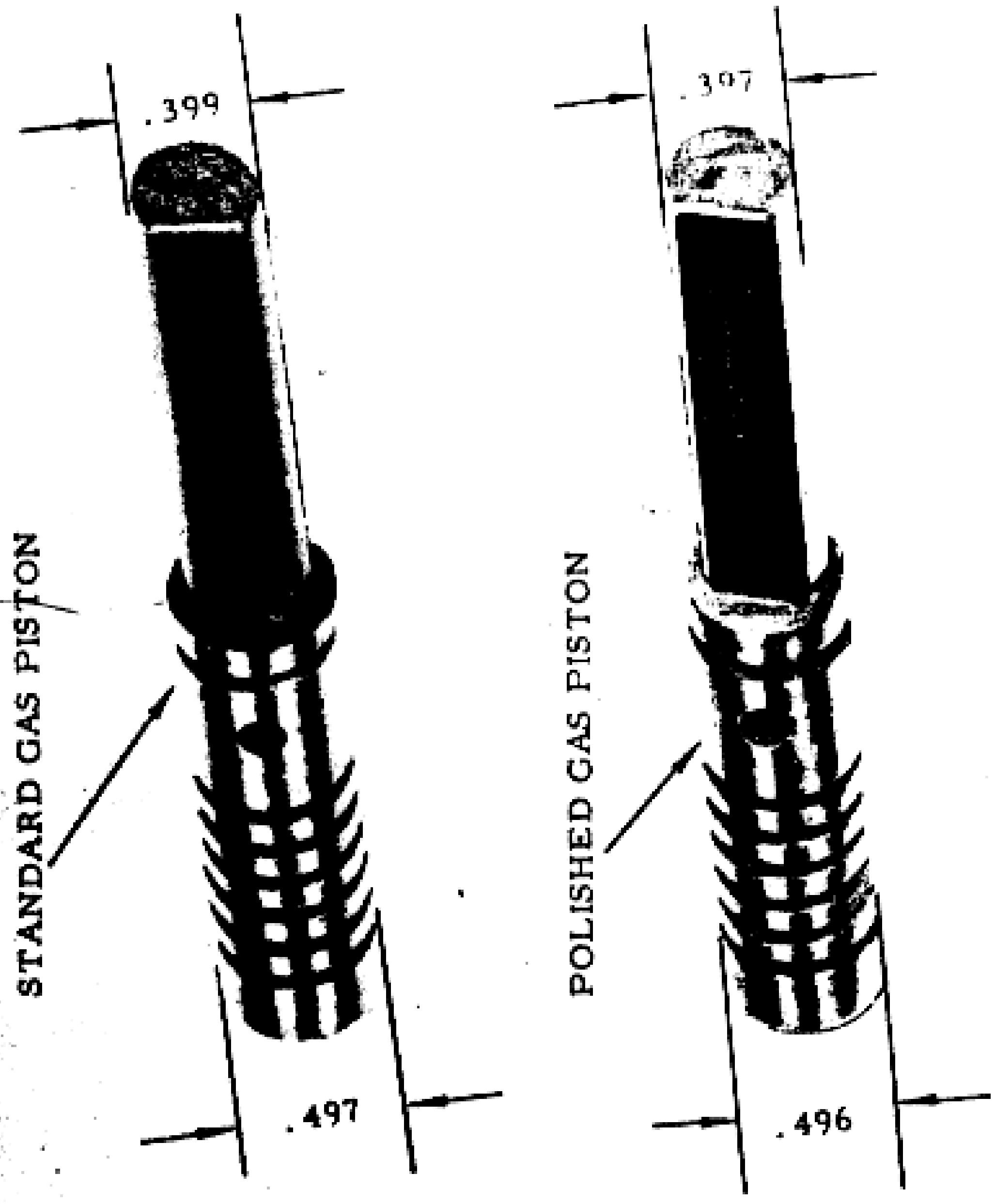


ILLUSTRATION "C" FIXTURE #1

4.3 PISTON

4.3.1 The piston must be polished lengthwise with 500 grit. This is to reduce carbon build up while firing. See illustration "D".



ILLUSTRATION"D" PISTON MODIFICATION

4.4 SUPPRESSOR

4.4.1 The front opening must be reamed to the diameters and taper shown in illustration "E". These dimensions have been proven in actual firing tests, to give the best accuracy with M-118 match ammunition.

4.4.2 The rear end must be machined to the diameter shown in illustration "E" in order to eliminate any possibility of misalignment due to side pressure in the assembly of the suppressor to the barrel. The area between the flutes and face of barrel should be reamed to .375 or 3/8". A 3/8" drill may be used for this cut. (Refer to Figure E1). This should be the last cut on the suppressor.

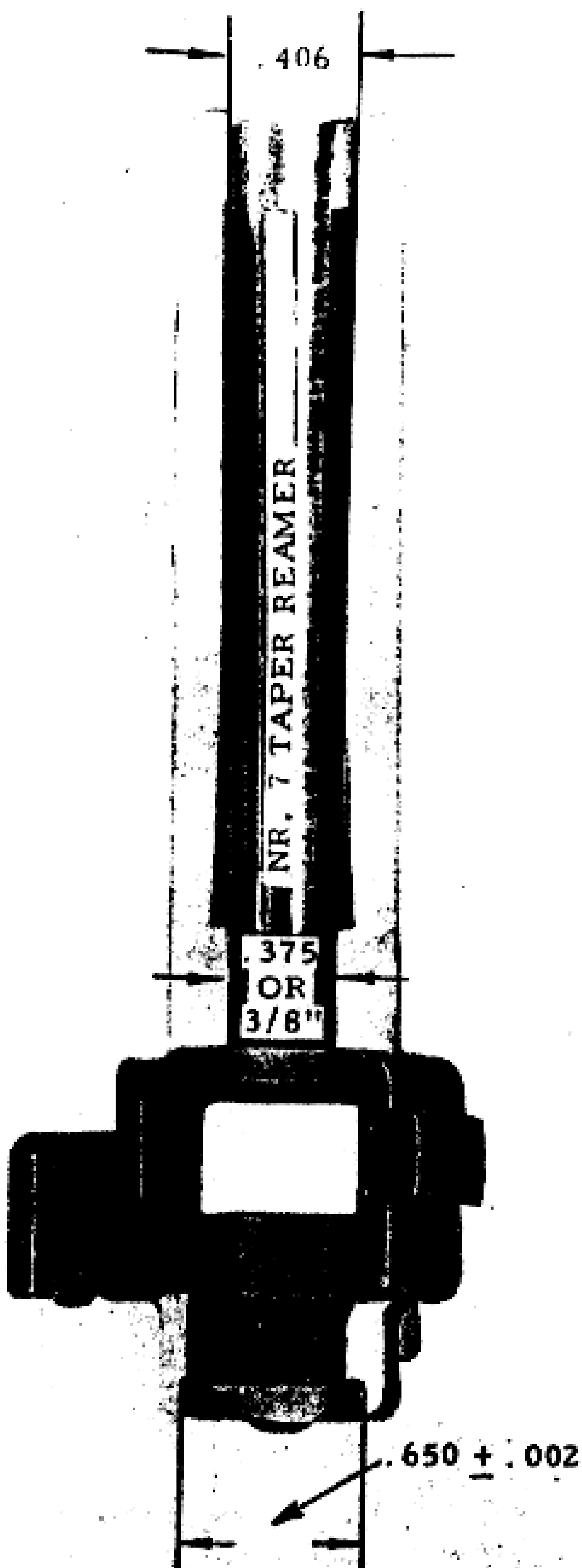
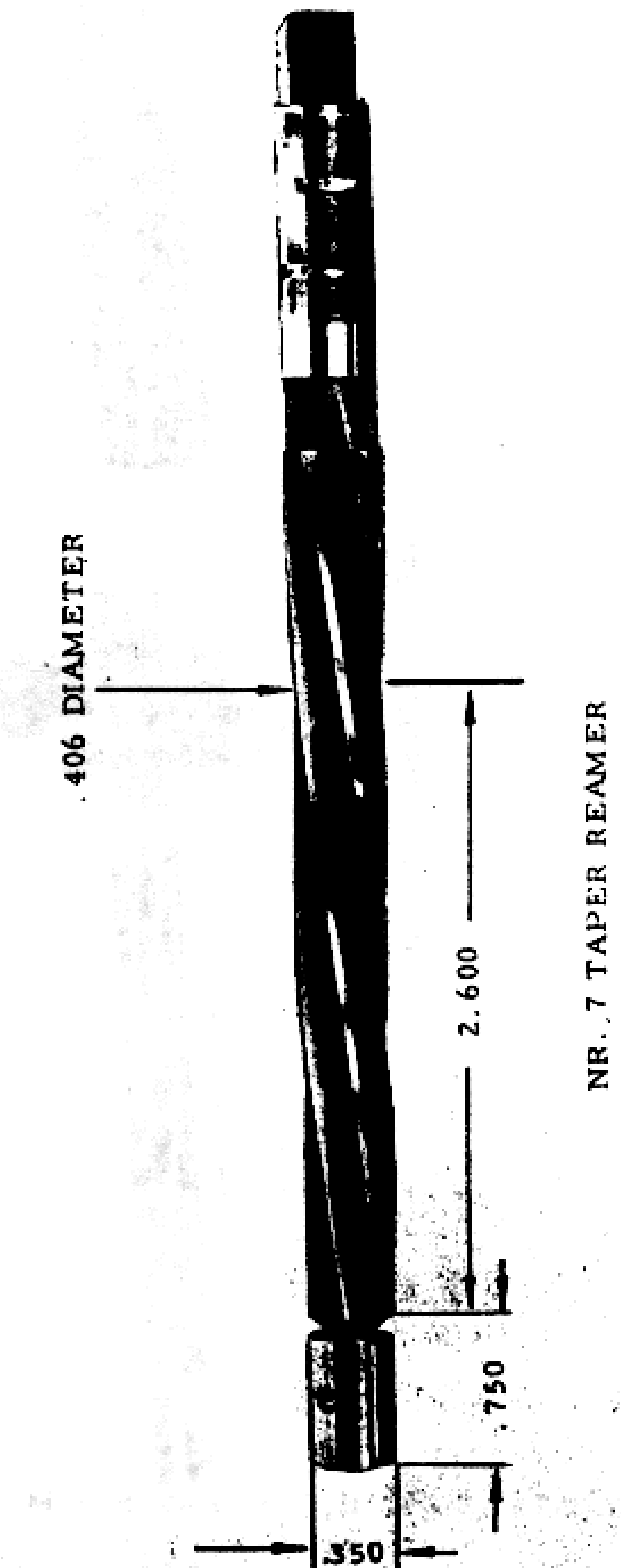


ILLUSTRATION "E_1" SUPPRESSOR MODIFICATION



12 ILLUSTRATION "E_2" SUPPRESSOR MODIFICATION REAMER

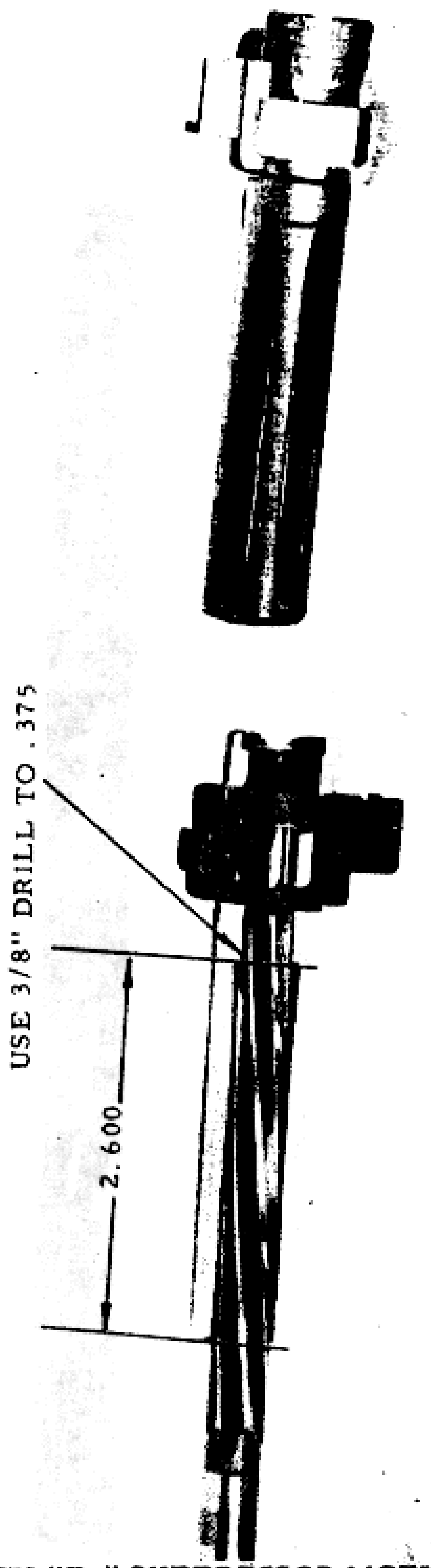


ILLUSTRATION "E_3" SUPPRESSOR MODIFICATION

4.5 HAND GUARD

4.5.1 The bottom edges of the hand guard must be removed to assure a clearance of approximately 1/16" between the top edges of the stock and the operating rod in its forward position.

4.5.2 The rear of the hand guard must be filed off to allow a small clearance between hand guard and receiver when the hand guard is in its fully forward position. A piece of Neoprene 1/2" square and 3/16" thick should be glued to the bottom of the hand guard where it clamps over the barrel. This is to hold the hand guard off the barrel.

4.6 FIRING MECHANISM

4.6.1 The raised metal in the trigger housing that holds the safety spring in position, should be rolled down over the safety spring to hold it in a more secure position. Thic can be done by peening with a flat ended punch.

4.6.2 The "working" surfaces of the trigger should be polished with a fine stone to remove the phosphate coating in preparation for adjusting the trigger "pull".

4.6.3 Polish the hammer spring housing where it comes in contact with the trigger housing to reduce friction.

4.6.4 The "working" surfaces of the sear should be polished with a fine stone to remove the phosphate coating in preparation for adjusting the trigg 'pull".

4.6.5 The trigger and hammer pins should be checked for wear and out-of-round if not new. Out-of-round pins will cause changes in the weight and length of trigger pull as they reposition themselves with use.

4.6.6 The working surface of the hammer should be polished with a fine stone to remove phosphate coating in preparation for adjusting the trigger "pull".

4.6.7 Lubrication prior to assembly. Place lubri-plate in the following areas:

4.6.7.1 Contact point between hammer and hammer spring plunger.

4.6.7.2 Contact point between hammer spring and housing and trigger assembly.

4.6.7.3 Contact point between hammer spring and safety.

4.6.8 Trigger weight should be between 4 1/2 and 4 3/4 pounds.

4.6.9 Slack in take-up should be smooth, and release of hammer "crisp", with no discernible "creep".

4.6.10 Adjustment of trigger mechanism to obtain desired pull.

4.6.10.1 If there is too much movement, after the "slack" has been taken up, before the hammer is released, it is necessary to reduce the contact distance on the inside hammer hooks. This is done by removing metal on the rear hooks, a little at a time, until the desired contact distance is obtained. This is done by the use of a fine stone. In cases where considerable metal is to be removed, it can be ground off first and then finished with a stone.

4.7 STOCK

4.7.1 Stock material to be Walnut with no sap wood.

4.7.2 Stock must be impregnated with an epoxy using approximately the same procedures used by Western Sealant of Norwald Connecticut and for the following reasons: See Annex A

4.7.2.1 To reduce internal moisture to a low percentage.

4.7.2.2 To water proof the stock.

4.7.2.3 To increase tensile strength in order to hold proper lower band/stock ferule pressure which is explained later in the text.

4.7.2.4 To prevent warpage.

4.7.2.5 The impregnating process leaves a desirnable dull finish, having better concealment characteristics than a normal stock.

4.7.3 Stocks to be so treated should be unoiled to assure proper penetration of the epoxy and the adherence of the bedding material.

4.7.4 Prior to inletting for bedding material, the stock liner should be removed and modified as specified in illustration "F" to provide a minimum of 1/8" of bedding material in the critical areas between the liner and receiver.

4.7.5 The stock ferule and wood in that area to be cut to the configuration and dimensions shown in illustration "G" and area of contact with lower band polished.

4.7.6 Wood in the receiver, magazine, liner and trigger housing areas of the stock to be removed to the configuration and dimensions shown in illustration "H".

4.7.7 Due to epoxy content of the stock material, Tungsten Carbide cutters are recommended for the operations performed in 4.7.5 and 4.7.6.

4.6.10.2 If the situation should occur when the hammer is released during the "slack" movement of the trigger (prior to meeting the resistance of the normal pull), the sear to trigger spacing must be reduced and this is done by removal of metal on the contact point between sear and trigger. It is not necessary to disassemble these parts but simply place an emory board (type used to file your finger nails) between the parts and reduce the distance until the correct pull is obtained.